بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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Effect of different surface treatments on bond strength of resin cement to two recent ceramic materials

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Dedication

*This thesis is dedicated to **my dear Parents**, who helped & supported me all the way since I started my Dental career, I dedicate my work as well to my cherished & loved little **Sister** & **Brother** who always had my back & been here for me.*

List of Contents

Title	Page No.
List of Tables	i
List of Figures	ii
Introduction	1
Review of Literature	4
Statement of Problem	26
Aim of the Study	27
Materials & Methods	28
Results	50
Discussion	73
Summary	83
Conclusions and Clinical Recommendations	86
References	87
Arabic Summary	—

List of Tables

Table No.	Title	Page No.
Table (1):	List of materials & equipments used.	28
Table (2):	Cement characteristics	29
Table (3):	Physical Properties of Crystal Ultra:	31
Table (4):	Chemical composition of the ceramic part	33
Table (5):	Physical/mechanical properties of vita enamic:	34
Table (6):	Samples grouping& factorial design:	37
Table (7):	Descriptive statistics for microshear bond strength (Mpa) of different groups	50
Table (8):	Effect of different variables and their interactions on microshear bond strength (Mpa)	51
Table (9):	Mean ± standard deviation (SD) of microshear bond strength (Mpa) for different materials	52
Table (10):	Mean ± standard deviation (SD) of microshear bond strength (Mpa) of different surface treatments.	53
Table (11):	Mean ± standard deviation (SD) of microshear bond strength (Mpa) for different materials and surface treatments	56
Table (12):	Frequencies (n) and Percentages (%) of mode of failure in different ceramic materials.	59
Table (13):	Frequencies (n) and Percentages (%) of mode of failure in different surface treatments.	62

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Breeze self adhesive resin cement.	29
Figure (2):	Crystal Ultra CAD block.	30
Figure (3):	Vita Enamic CAD block.	32
Figure (4):	Porcelain etchant gel.	35
Figure (5):	Porcelain Primer.	36
Figure (6):	isoMet 4000.	38
Figure (7):	Vita Enamic block (A) Crystal Ultra block (B) being cutinto slices using iso Met 4000.	38
Figure (8):	Thickness of the Ceramic slice 1mm	39
Figure (9):	Vita Enamic slices (A) & Crystal Ultra slices (B) Embedded in acrylic blocks each given initial related to surface treatment that will be done	39
Figure (10):	Application of Hydrofluoric Acid (A) for Vita Enamic (B) for Crystal ultra.	40
Figure (11):	Application of Silane (A) for Vita enamic & (B) for Crystal ultra.	41
Figure (12):	Sandblasting of VITA Enamic	42
Figure (13):	Water lase i Plus; Biolase Technology Inc	43
Figure (14):	Laser etching for ceramic slice	43
Figure (15):	Irises of polyethylene tube having 1mm diameter and 1mm height.	44
Figure (16):	Resin cement injection into the irises on the surfaces of ceramic discs in (A) for crystal ultra & in (B) for vita enamic, then light curing was done for (c) resin tubes on crystal ultra & for (D) resin tubes on vita enamic surfaces for 60 seconds for each specimen. Fully cured resin tubes (E) on the crystal ultra ceramic surface & (F) on the vita enamic ceramic surface.	45
Figure (17):	THE-1100 SD Mechatronics thermocycle	46
Figure (18):	micro shear Testing Machine.	46
Figure (19):	A loop wrapped around bonded micro cylinder.	47

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (20):	Quattro S Environmental (SEM) Scanning electron microscope.	48
Figure (21):	Box plot showing microshear bond strength (Mpa) of different groups.	50
Figure (22):	Bar chart showing average microshear bond strength (Mpa) for different material.	52
Figure (23):	Bar chart showing average microshear bond strength (Mpa) of different surface treatments.	54
Figure (24):	Bar chart showing average microshear bond strength (Mpa) for different materials and surface treatments (A).	56
Figure (25):	Bar chart showing average microshear bond strength (Mpa) for different materials and surface treatments (B).	57
Figure (26):	Bar chart showing percentage of mode of failure in different ceramic materials.	59
Figure (27):	Pie chart showing percentage of mode of failure in Crystal ultra.	60
Figure (28):	Pie chart showing percentage of mode of failure in Vita Enamic.	60
Figure (29):	Bar chart showing percentage of mode of failure in different surface treatments.	63
Figure (30):	Pie chart showing percentage of mode of failure in samples treated with etching & silanation.	63
Figure (31):	Pie chart showing percentage of mode of failure in samples treated with sandblasting & silanation.	64
Figure (32):	Pie chart showing percentage of mode of failure in samples treated with laser & silanation.	64

List of Figures Cont...

Fig. No.	Title	Page No.

Figure (33): Image (A)ESEM Photomicrograph (2000x) of Vita Enamic material (VE) non treated surface showing relative degree of smoothness & showing interpenetrating networks &for Image (B) ESEM Photomicrograph (2000x) of Crystal Ultra before any surface treatment done showing smooth & homogenous surface with no retentive features. 65

Figure (34): Each image indicate the the type of material either C for Crystal ultra or V for Vita enamic, & the second letter indicate the surface treatment done,E for acid etching & silanation, S for sandblasting & silanation and finaly L for laser etching & silanation. 67

Figure (35): SEM photomicrograph showing Cohesive mode of failure in VE..... 68

Figure (36): SEM photomicrograph showing Cohesive mode of failure found predominantly in the CE group. 69

Figure (37): SEM photomicrograph showing cohesive mode of failure dominanty in CS group..... 69

Figure (38): SEM photomicrograph showing mode of failures occurred in VS group dominantly (A) cohesive & (B) mixed failures. 70

Figure (39): SEM photomicrograph showing failure mode in group CL was dominantly (A) Adhesive & (B) Mixedtype of failure. 71

Figure (40): SEM photomicrograph showing adhesive mode of failure mainly occurred with VL group. 72

Introduction

In the last couple of years, there was a break through in ceramic development. However, the focus was on the hardness and the strength of the restorative materials, which resulted into high antagonistic tooth wear.

There was a new approach for the material tested, to modify ceramics to create a bio-mimetic material simulating the physical properties of dentin & Enamel, as the long-term aim is to imitate the mechanical behavior of a natural tooth. And still they have strength similar to or near conventional ceramics.

As a result for that new materials were introduced in dental market, Polymer infiltrated ceramic network (PICN) materials Also known as hybrid ceramics are currently being introduced for CAD/CAM use.

(PICN) CAD/CAM materials have reduced brittleness, rigidity and hardness with improved flexibility, fracture toughness and better machinability compared to ceramics and due to the presence of two connected phases within (PICN) crack propagation is generally limited because of interfacial crack deflection. The phase with the higher strain to failure enhances the fracture resistance by bridging the cracks introduced to the other phase.

During the last decade Computer Aided design computer aided manufacturing (CAD/CAM) has been known widely and gained popularity in dental applications.

This explains the appearance of new CAD/CAM ceramic materials keeping pace with the new technology & fulfilling the concept of fabrication of tooth like restorations.

Hybrid ceramic material have been divided in further two subgroups:

1) Interpenetrating glass ceramic network infiltrated by resin network (polymer infiltrated ceramic) which is called true hybrid ceramic because it consist mainly of a dominant ceramic network (86 wt.%) strengthened by an acrylate polymer network (14 wt.%) example of this Material is (VITA Enamic, VITA Zahnfabrik, Bad Sackingen, Germany) it has aluminum-oxide enriched, fine-structure feldspar matrix infused by polymer including urethane dimethacrylate (UDMA) and others.

2) Resin matrix or network infiltrated with glass ceramic fillers refered to as CAD/CAM Resin Nano ceramics.

Example of this subgroup: Paradigm MZ100, Lava Ultimate, Cerasmart and Crystal Ultra, which is rescently applied in market by Dental Laboratory Milling Supplies, LLC (DLMS).Crystal Ultra is Sailinated glass ceramic polymer hybrid restorative with glass fillers of 70.02% (wt).

The adhesion of indirect restorations to the tooth structure is a very critical step where underestimating it will influence durability and success of restorations.

By overcoming failures that occur due to improper bonding we can reach the best durability of the restoration helping us reach our goal which

is fabricating a restoration that mimics natural teeth. So an ideally bonded restoration will fulfill high retention, preventing micro-leakage, and creating good marginal adaptation.

As a result of continual developments in technology, new methods of production and new treatment ideas may be expected due to Recent ceramic materials being introduced in the market every mean & a while, There is deficiency in the research about the newly introduced CAD/CAM material& the best bonding methods that suits their retention &proper adaptation to tooth structure giving successful restoration with longer life span.